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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/164,517	09/30/1998	JIE LIANG	TI-26414AA	6766
23494	7590	11/29/2004	EXAMINER	
TEXAS INSTRUMENTS INCORPORATED			WU, JINGGE	
P O BOX 655474, M/S 3999			ART UNIT	
DALLAS, TX 75265			PAPER NUMBER	

2623

DATE MAILED: 11/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/164,517

Applicant(s)

LIANG ET AL.

Examiner

Jingge Wu

Art Unit

2623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 June 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

1. In view of the board decision filed on June 30, 2004, PROSECUTION IS HEREBY REOPENED. The board reversed the rejection under 35 U.S.C. §103 of claims 1-7 based on Boliek does not constitute legally available prior art under 35 U.S.C. §102 (e) (page 5, line 9-10). However, the board did not decide substantive issue related to Keith patent (which is parent patent of Keith). The Examiner believes that Keith is a proper prior art under 35 U.S.C. §103 and discloses all limitations in the Boliek, thus, requires the reopen the prosecution under **MPEP 1214.04**. A non-final action follows.

***Claim Rejections - 35 U.S.C. § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent 5966465 to Keith et al. ("Keith") in view of U.S. patent 5442458 to Rabbani et al. ("Rabbani" a reference of record).

As to claim 1, Keith discloses a method of encoding an image (abstract), comprising:

a) decomposing an image into bit plane(fig.s 2a-2b and 3a-3d, col. 6 lines 62-66, col. 8 lines 37-39, col. 10 lines 4-7, col. 21 lines 21-25); and

b) arithmetic encoding the bitplanes with a context model from the neighboring bits in a bitplane (col. 21 lines 21-25, col. 24, lines 57-67, QM coder is a binary arithmetic coding).

Keith does not explicitly mention using the previous bit at the location in previous bit plane for the context model, which is well known.

Rabbani, in an analogous environment, discloses the step of arithmetic encoding the bitplanes with a context model from the neighboring bits in a bitplane and previous bits at location in previous bitplanes (Fig. 3 col. 4 lines 49-67 and col. 5 lines 40-68).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the previous bit plane in the context model of Rabbani in the method of Keith because it is desirable to obtain the optimal probability model based on the context and the efficiency for real time application (Rabbani, col. 1 lines 25-35). By using the scheme of Rabbani, the context for a coefficient contains more information about probability models of the coefficient so as to obtain efficient entropy compression of the coefficient so that the compression ration of the method is improved.

4. Claims 2-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Keith and Rabbani, further in view of U.S. patent 5357250 to Healey et al. ("Healey" a reference of record).

As to claim 2, Keith further discloses the decomposition includes:

a) wavelet transform the image into a hierarchy of coefficients and bitplanes are of transform coefficients (col. 21 lines 21-25) but does not mention the forgetting factor for adaptive context statistic determination which is well known in the art.

Healey, in an analogous environment, discloses that the arithmetic coding includes a forgetting factor for adaptive context statistic determination (col. 6 lines 13-54 and col. 9 lines 49-55).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the forgetting factor of the arithmetic coding in the method of Keith because it is desirable to efficiently encode the data stream (Healey, col. 7, lines 36-47 and col. 9 lines 55-59). By using the scheme of Healey, the context model based on probabilities sets as a function of the past bits occurrences so as to obtain efficient entropy compression of the coefficient so that the compression ratio of the method is improved.

As to claim 3, the combination of Keith, Rabbani, and Healey does not mention choosing forgetting factor is 127.

However, choosing the length of the forgetting factor is a designing choice based on the computing power and practical requirement of projects.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the forgetting factor 127 in the method of the combination of Keith, Rabbani, and Healey because it is desirable to obtain the optimal probability model based on the context for fast encoding (Healey, col. 7, lines 36-47 and col. 9, lines 55-59). By using the forgetting factor, the context for a coefficient would

contain a class of distributions integrated with regard to a prior distribution so as to obtain efficient entropy compression of the coefficient so that the compression ration of the method is improved.

5. Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Keith and Rabbani, further in view of U.S. patent 5703646 to Oda ( a reference of record).

As to claims 4 and 5, the combination of Keith and Rabbani dos not mention I, P, B frames and bi-directional motion compensation which is well known in the art.

Oda, in an analogous environment, discloses I, P, B frames and bi-directional motion compensation (Fig. 5, col. 20 lines 25-55) as well as wavelet transforming the I frame (col. 22 lines 15-16).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the wavelet compression for the I, P, B frames of Oda in the method of Keith and Rabbani in the series video because it is desirable to obtain high quality image with complicated patterns in high speed encoding (Oda, col. 6 lines 31-43). By using the scheme of Oda, the quality of pictures as well as transmission speed of the method is improved.

6. Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Keith and Rabbani, further in view of U.S. patent 5901251 to Rust (a reference of record).

As to claim 6, the combination of Keith and Rabbani mentions context model but does not explicitly mention simple and natural images and choosing the context model accordingly.

Rust, in an analogous environment, discloses the steps of :

- a) the decomposition of the image into bitplanes includes a partition of the image into simple (text/line art) and natural (pattern) portions (col. 11 lines 7-24); and
- b) the arithmetic coding uses different context modes for the simple and natural image portions (col. 5 line 52-col. 6 line 4 and col. 9 line 43-col. 10 line 2).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the adaptive arithmetic coding based on different context model of Rust in the method of Keith because it is desirable to use arithmetic coding adaptive to the context for better compression (Rust, col. 3 line 33-col. 4 line 4). By using the scheme of Rust, the arithmetic coder adaptively uses context models for obtaining efficient entropy compression of the coefficient so that the compression ration of the method is improved.

#### **Contact Information**

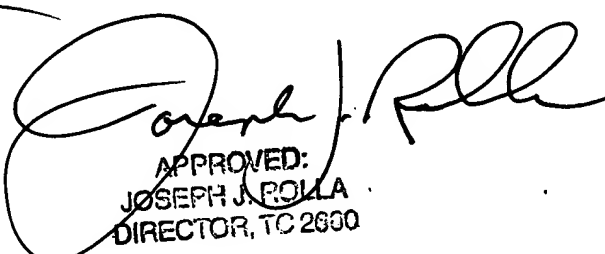
Any inquiry concerning this communication or earlier communications should be directed to Jingge Wu whose telephone number is (703) 308-9588. He can normally be reached Monday through Thursday from 8:00 am to 5:30 pm. The examiner can be also reached on second alternate Fridays.

Any inquiry of a general nature or relating to the status of this application should be directed to TC customer service whose telephone number is (703) 306-0377.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Amelia Au, can be reached at (703) 308-6604.

The Working Group Fax number is (703) 872-9314.

Jingge Wu  
Primary Patent Examiner



APPROVED:  
JOSEPH J. FOLLA  
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